Searching for the Green Laboratory Building Exhaust

Presented to

Labs For the 21st Century Conference

Presented by

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Strobic Air Corporation

A Subsidiary of Met-Pro Corporation

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The Green Lab Exhaust is:

- **Safe for Humans**
- **Energy Conservative**
- **Minimizes Environmental Damage.**

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SAFETY -- The Problems

- **An estimated 25% of Labs experience blow-back of toxic fumes for some winds.**

- **1992 OSHA Lab Standard says lab workers can see life-spans 10 years shorter.**

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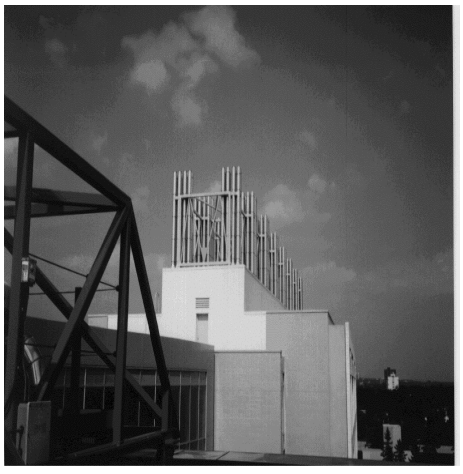
Problems with Single hood-- Single Stack

- **Low exit velocities (1,000-1,500 fpm) with down-wash probabilities.**



- **Lost fan motor creates back-flow through the stack and into lab.**
- **High Energy Use**

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Is Your Stack Tall Enough?

- **Height is Not Enough.**
- **Must have Flow Volume &**
- **Exit Velocity**

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The Basics for Green Exhausts

- **Fans outside on Highest roof.**
- **Point the exhaust upwards, with minimum 10 height, no caps or goosenecks.**
- **Minimum exit velocity of 3,000 ft/min.**
- **Maximize Flow by Manifolding inside lab or adding in air at the roof.**
- **Treat exhaust or dilute it to increase human safety and to reduce environmental hazard.**
- **See ASHRAE 1999, Ch. 43.**

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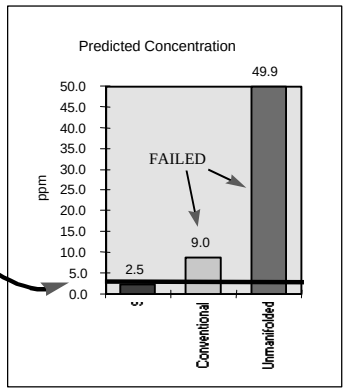
Safety--Method Comparison

Example from a recent project:

Fans:

Strobic TS3L200B12
Conventional
Un-manifolded (1000cfm)

Halitsky dilution criteria requires **3 ppm** or lower air intake concentration for a 15 cfm chemical release



RATCLIFF & ASSOCIATES

Michael A. Ratcliff, Ph.D., P.E.
Stack Design and Airflow Around Buildings
Laboratory Fume Hood Testing

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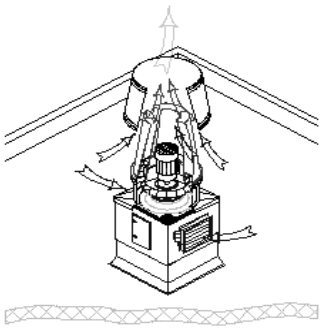
ENERGY CONSERVATION

- **Direct Drive eliminates belt losses and breakdowns.**
- **Optimum inlet/outlet design reduces pressure loss 30%.**
- **Use 2 large fans at high efficiency instead of 100 smaller fans.**



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ENVIRONMENTAL IMPACT

- **Where possible, Provide treatment system or scrubbers to remove hazards from airstream**
- **Use Dilution if no other treatment possible.**
- **Noise pollution should be considered.**
- **Consider Visual Impact.**

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